

IEC 61850 Certificate Level A¹

Issued to:
DONGWOO ELECTRIC CORP
34, Oseongseo-ro, Anjung-eup,
Pyeongtaek-si, Gyeonggi-do,
Republic of Korea, 17928

For the client system:
SA-OPD (Substation Automation Operation
Processing Device)
DWSA-OP
Software Version 1.0
HW : HP Z2 Tower G9 Workstation
OS : Windows Server 2019
S/N : DWSA-OP-2024-001

Issued by: **KOREA TESTING LABORATORY**

**The CLIENT has not been shown to be non-conforming to:
IEC 61850 Edition 2 Parts 6, 7-1, 7-2, 7-3, 7-4 and 8-1
Communication networks and systems in power utility automation**

The conformance test has been performed according to IEC 61850-10 Edition 2, the UCA International Users Group Edition 2 Client Test Procedures version 1.2 with product's protocol, model and technical issue implementation conformance statements: "DongWoo-DWSAOP_Client_Pics_Ed2.0", "DongWoo-DWSAOP_Client_Mics_Ed2.0", "DongWoo-DWSAOP_Client_Tics_Ed2.0" and product's extra information for testing: "DongWoo-DWSAOP_Client_Pixit_Ed2.0".

The following IEC 61850 conformance blocks have been tested with a positive result (number of relevant and executed test cases / total number of test cases):

| | | | |
|----|--------------------------------|-----|-------------------------------|
| 1 | Basic Exchange (22/24) | 12a | Direct Control (7/9) |
| 2 | Data Sets (8/10) | 12b | SBO Control (9/11) |
| 2+ | Data Set Definition (8/8) | 12c | Enhanced Direct Control (7/9) |
| 4 | Setting Group Selection (3/3) | 12d | Enhanced SBO Control (9/11) |
| 4+ | Setting Group Definition (5/5) | 13 | Time Synchronization (3/4) |
| 5 | Unbuffered Reporting (23/24) | 14 | File Transfer (5/8) |
| 6 | Buffered Reporting (27/28) | 15 | Service Tracking (7/17) |
| 9 | GOOSE Control Block (2/2) | | |

This certificate includes a summary of the test results as carried out at Seoul in the Republic of Korea with IEC 61850 Ed2 Virtual Server version 1 with test suite IEC 61850 Ed2 Client Conformance Verifier1.0 and KEPSCO ANALYZER 1.0. This document has been issued for information purposes only, and the original paper copy of KTL report: No. TR-24-045122-01-2 will prevail.

The test has been carried out on one single specimen of the product as referred above and submitted to KTL by DONGWOO ELECTRIC CORP. The manufacturer's production process has not been assessed. This certificate does not imply that KTL has certified or approved any product other than the specimen tested.

Seoul, Nov. 01, 2024

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1 Level A - Independent Test lab with accredited ISO/IEC 17025 Quality System

Applicable Test Procedures from the UCA International Users Group Edition 2 Client Test Procedures version 1.2

| Conformance Block | Mandatory | Conditional |
|------------------------------|--|--|
| 1: Basic Exchange | cAss1, cAss2, cAss3, cAssN1, cAssN4, cAssN5, cAssN6 | cAssN7, cSrv1, cSrv2, cSrv3, cSrv4, cSrv5, cSrv6, cSrv7, cSrv8, cSrvN1, cSrvN2, cSrvN3, cSrvN4, cSrvN5, cSrvN6 |
| 2: Data Sets | | cDs1, cDs2, cDs3, cDs5, cDs6, cDsN1a, cDsN1b, cDsN1c |
| 2+: Data Set Definition | | cDs10, cDs11, cDs12, cDs13, cDs14, cDsN10a, cDsN10b, cDsN11 |
| 4: Setting Group Selection | cSg2, cSgN1 | cSg1 |
| 4+: Setting Group Definition | cSg11, cSg14 | cSg10, cSg12, cSg13 |
| 5: Unbuffered Reporting | cRp3, cRp4, cRp5, cRp8, cRp9, cRp10, cRp11, cRp13a, cRp14, cRp15, cRp19, cRpN2, cRpN5, cRpN6 | cRp1, cRp2, cRp6, cRp7, cRp12, cRp13b, cRp16, cRp17, cRpN1 |
| 6: Buffered Reporting | cBr3, cBr4, cBr5, cBr8, cBr9, cBr10, cBr11, cBr13a, cBr14, cBr15, cBr19, cBr30, cBr31, cBrN2, cBrN5, cBrN6 | cBr1, cBr2, cBr6, cBr7, cBr12, cBr13b, cBr16, cBr17, cBr32, cBr33, cBrN1 |
| 9: GOOSE Control Block | | cGeb1, cGeb2 |
| 12a: Direct Control | cCtl4a, cCtl5a, cDOns1, cDOns2 | cCtl1a, cCtl2a, cCtl3a |
| 12b: SBO Control | cCtl4b, cCtl5b, cSBOns1, cSBOns2, cSBOns3 | cCtl1b, cCtl2b, cCtl3b, cSBOns4 |
| 12c: Enhanced Direct Control | cCtl4c, cCtl5c, cDOes1, cDOes2 | cCtl1c, cCtl2c, cCtl3c |
| 12d: Enhanced SBO Control | cCtl4d, cCtl5d, cSBOes1, cSBOes2, cSBOes3 | cCtl1d, cCtl2d, cCtl3d, cSBOes4 |
| 13: Time Sync | cTm1, cTmN1 | cTm2 |
| 14: File Transfer | cFt1, cFt3, cFtN1 | cFt2, cFtN2 |
| 15: Service Tracking | | cTrk1, cTrk2, cTrk7, cTrk8, cTrk9, cTrk10, cTrk11 |